

16pt 23 1869 As Cartarene can be preserved only very imperfeelly in the Herbarium, it is necessary to draw up a description on the spot - for which the following direction, will be found useful. note as with all other plants, the locality There the plant grows, in moist or dry shady or sunny places, in sand or on vocks; also the period of flowering and of the maturity of the fruit I Vegetative parts of the plant. 1. The truck shape (globose, or depressed, or oval; elongated, uniform or jointed, simple or Cranched (and form and Siretion of Granches); erect, prostrate or climbing, with or willwest - serial roots; terete, or ribbed, or winged, or compressed; or covered with televilles (called mamillae); if ribbed or compressed, the angles cright to be described. They are sharp & or rounded, and (seen in profile) sinuate or crenate the The grooves between the angles and shallow on deep. Best give a rough skelch of existence south of plant word, buds of S. all Carli produce Twoolly (more or less) specify called areolae from thick bunches of spices or flowers or both. These arcola formish assupertant characters and it is neversary to note of their position, other position or immersed (revealor or order or eller shape (revealor or order or elongated) size and usual Sitance from one another their modition in youth and age, and their coaling with tomentum or work of D'Hennes colours. A. On these arcolar the spines are for To chamiter of the whole facing. spines are extremely

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slender, brillalite, sociale, viter Discetion. shooked et an augular or smooth or annulated, a of differe colours which it is well to kote. The are often arranged very regularly, shich can be best illustrated by Stagramy growing also the shape of the arrola, for example (000) or mor en less vregalady a Am ragentet chand is their stability on change with a continuing to wantly the age if strong species, they size of the arisher and the number of spines intreases with for many years shall in others save formed, they never change and Nop of with age if flower as 21 dea on an for only on the opentie as Veire ierice; in the former they are always
Livete on sery left compress the letter flat

o somether was pariet to the leave of opentire, winform as they seem to be formsh som chanters by their size . I direction (asprom, sprealy received) I Reproduce but of the place 1. Flower. The flowers are produced for som fthe buds (avolve) resuelle on parts of the place not Siferis from the steril ones; in some general howen, It flowering part widely differ from the stande one; this is the town expenses i Melometer, and i stat i usually oulle Moneraus The flowers spring from the your, nessent, arcolaes, just formed or forming therefore and from the after of the plant and from the after of the plant and from the new growth of the past few weeks or parts

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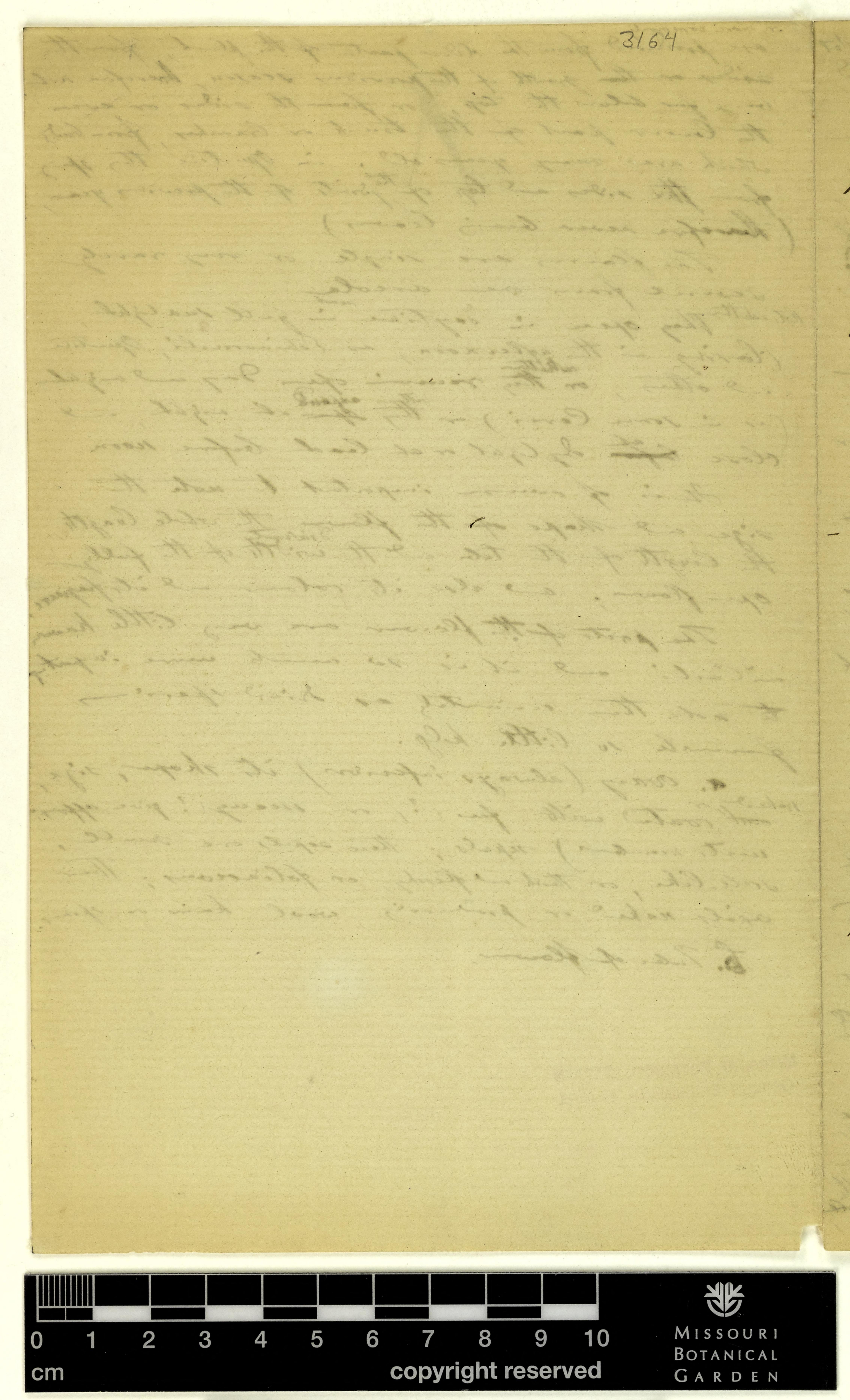
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or, more commonly from the older facts of the plant for the sides on the growth of the processon season, brevefor not very for belows the top on from the sides on even the lower part of the trunk or Grander, from buts Shoth are may years all in opentice they spry from the sides and top of figurity of the process year (therefore never bears) The flower, are single or very ravely severe fran one arcola Astishtte They open i daytime i fell sua light, Closing i the ashermoon, as Colinorali, Opentite I other, on they remain open day a saight (us i some Cerci) in they of al wight, I close of by Cylil or at land before noon His of come important to note the size as shape of the flowing the shele length, the length of the tale of the wisth of the fully ope flow, at also its color I its pagner, The parts of the flavour one was cittle known et it is so and were injusting to ade the ecciantely and Sind spent finde 10 little kelp. naked or att with few (?) or many!? give approx. unti humber) sepals; There sepels ove saule, sale-like, or thish as fleshy, or foliareous; their afils naked or producty wool hair or the D. The of flow.

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Instructions for those that have an opportunity to observe or collect Carti in the field The first thing you observe. ni a Cactus age the spines see pag 3 for find these spines in bunches together These bunches are disposed grow from a well market sport, which is called the æreola, their spok is when. young generally covered with white or collowed wood which after some truce Dappen or with sharp brittles in the genus Opuntia). The arcola is round or oval or elongated, lireau etc. The areolae with their spine are disposed in the on the or midges an they amount are each found supported by a shorten or of the gove tuber les or they are disposed over the suore or less smooth surface semment sidges or tuberles. The spines Themselves... are of very different shape: size legtt a strengtt : Generille de frat some more souther and others Light spreading like MISSOURI BOTANICAL

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The first thing you observe in a Carther is the thape At is either more on less globose, oval on proliferous (that is to say, producing short flattenened; on it is some (that is to say, producing branches) glindrie, roundesh on augular, erect or prostrute or even elimbing, Fistiple or branching ; _ or it is jointed, the joints are flat, leaglike, or they are more or less sound /cylinder The globose Cartust plants skem either ridges with corresponding groover beliveen. Then or they are rowered Groot Haberber. The niges are proterte or more or less spiral, They ære skarp, or rounded uniform stright wavy on x they show rousiderable constancy interrupted. The growing in their mulber, some Cathi have 3, 4, 5, 6, 7 mg nidges or vile from that the number frequelly nies to are also deep on shallow, wide or sharp. 10.13.18.29.21. The taleroles jane longen for shorter from almost spherical to fragen shaped MISSOURI BOTANICAL GARDEN They are always spirally) GEORGE ENGELMANN PAPERS (disposed) They are round or angulan, or groved on the upper side smooth waked or woolly in their axills. The oylinds Certies plant are almostell more or les groover or angular, and MISSOURI BOTANICAL copyright reserved

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in regard to the I have to repeat thehad have just seit about The ahandelenstit of the nogen as growes. The jointed Carties plants are flat like the comme Jardiakly pean or round, sten, like The Thepe of the the surface wheth smooth on more or less uneven by Fubriles furnist many differences. I com now to one of the most important charactersting of the Courter Inter. He Spines. · Ude find the mannely single zunenlleg tte are in beauty togette. nide p. /. voli pag!! Pagg _ sagg generally the central and madel spines are of of theme age size a 9 of Doler * hairlike shirts are sound or flet real stiff spines; some an flet orangelan; they are smooth The alastistic of parkment or annulated of transversely grown other any value but moved of ved 2; straight curved The man of the second or kooked, white gellow, brown or black. The flowers appear either from the growth of the same year or for that of former years for tholder part of the plant . In the first are MISSOURI BOTANICAL

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in the latter more or less or sides of the plant. The fact The flower of the rance years growth are found either on sight on the topse in the rentire for eventual) on they are more or less the first base the plant does not grow further luteral near the top. The till aft the slowing or at even till next spring. i the severed mes flowing either owner out at it omtimes to grow as to once or al least within a few ogrpshis ets which such as the wales i the spring or early the originally rental flower bud sommer or they are findende thoughout the season, in what MISSOURI BOTANICAL GARDEN GEORGE ENGELMANN PAPERS latter rase flower, a freil coult be found on the same plantet same line. The Cartus flower has nos insleded in the florers but supporting the same an juferior ovary (or fuilbud) This is naked [Mammillana) or covered by scales (Echinocactus) or woolly hairy and spring on elevated arcolae (Cereus) on bearing Ly terete (now the awlshaped) leaflet, (Quintin). These are the only de general for 9 - Some a far in the state extratropiere parts of North America. The numerous leastes of the flower form esthe a tube which is in most of our Caiti short and augmentel bell or funnel spaped on long, tubular as in many souther speries. or it is entirely wanting MISSOURI BOTANICAL

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in all Opuntial, where the flower, who fully open is flat without like a plate, without any tube. The leastes forming the flower may be d'vided in the outen coursen mostly starter, and more or les greenish ones, Tepals, and Hu inner Hime more delitate ones of more beautiful rolours, the petals. The flowing includes numerous stamens, and in the centre The style, which is as long as the stamens on more or less elongated, il is al is Abjuly separated into a numby of partition, Hu stigmata which are of different colonis and are evert, on recurred or oups shaped ette. The fluid of the Cartus is oftendifferent shape, and volon mooth taked or covered by scales tofk very this ones) on britles on world etc. The finit has some on top the withered flower or it is naked in the latter tase it genenly bears a more or less large at deep mark Where the flower has fullen of The Fit oppe fuil is either Jericy on dry; it contains fen on many seed of Tifferent colour and shape smooth or wrinkled or pitted or watte even or america.

(umbilions)

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- Cartus corrinellisen Sin - Cartus corrinelliser Sin in gost Cellis. month Clarge. After having examined in This 0. Tuna Mill Be. Ye of Ly, whole = Cette, Bampland Humb. O. Nopallella Karw. manner the most, aportant parts of the Carties, I shill non proveed to state, the primique Svisions of Their Humbold fift min 15 fruits, as fan as the are Carlen en 29 min nima Oprintin delsi 2 postiine 10 Cerci D2 2 Mipselis. suportat for the extention of regions of North Therenson. willdenne hounte 1799 mpt 29 1. Mammillania. Plant more a fen inches in Danneter or less globose, or ownl, or short eglindrical! covered with Auberiles, which bear spines on their paud (ave avonnged The foland of simple on brunching the Body of the plant; they in spisal rows. The flowers. are produced mainly from the gnortt of the same year, rarely from that of the preceding year. The flowers have in the former ouse a central position on They are more lateral, being sushed aside by the continuation of the growth of the plant at top. The evary of the flower is naked, that is, it is not rovered by scales or brittles. The tube of the flower is short, and white yellow or ved The fully ope flower is more or less bell shaped talways as fan ás I The fruit is teither red or green the forcer je In the former case v more or has falle of, it is t alvøy ås fær ås I have seen mote or less juig; it b less globose, ond blubshaped. Orthopind is green and then always orowned by the flower restant the passer as for as I have assertained, and of an oval shape. MISSOURI BOTANICAL copyright reserved

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The seed are black on Born or gellowish, globose or long. gmosth or prited 2. Eininocactus Hant more or less globose, en flattend, en oval t bunches of spines is Aalways simple vertitel on more or less sprink ridges or nids, nids Ettered Hanger states of Spercel, shape, thick or their, sharp or rounded_ aveolae approacher or Listant even or væavy on more on less interrupted this is espendly the case in young plants where the nos are Tomelitues almost separated, inte Sstruit taberiles some is always simple whit like Mammillania) and apparently brunching when The flowers are always produced would or ottorwise injured. Their size is larger than the from the same years growth manuflarine for a few whiles crowded to gethe at the top to several feel - Lameter or produced more leterally. 6-16 inden i thuseldige. but always the ovary is covered by this or hand inles or bridles and word. The flower is short where where fully open which as i Maminies is only the case in the mide * its colon is yellow fred on whiteil of the dry in bright sunshine! The fruit is dry hand on juicy always overed by the withered flower. The Leed sofar as I have seen un slevags bleck, The NS. The Geners Melorarty occurs only in høssical climates generally hear the sea coust, MISSOURI BOTANICAL

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A resembles i shape veg much the Echinoraitus, but the plants Afthis genus push when they are going to flower push for their top a woodly body with tubusles for shirt the flowers are providend. A lookas like a ivoolly Mammillani growing from an Echinoraaties. 3. Cereus plant more or less oglindrical, often short, val, or even globose, but mostly & for a few makes long, erect or sprending; rarely feel high for a few lines to several feel in Namute sigle mostly branched a The many stems from one base, Dorsy angled or sibbed flowers always from the growth of the tast preveding or formen yeurs. Ovary and tube covered by woolly somethit elevated arcolae (see above) which produce briskes or spikes; The upper tube of flower short, funnel or bill-MISSOURI BOTANICAL GARDEN Thaped on long, off very GEORGE ENGELMANN PAPERS long; flower open dry al Right, on night only or with mille of the day only a cin bright X volom sed mon sarely sunshine only; * Fruit so fan Stile an gellawith mil greenish as I know more or less juring with or without the remains of Hu flower. Teed black. Most of the northern Cerei are bee, of short low stature, resembling letinovartus & short bell shaped in shape, and have flowers. with more the less But Thony branching are branching or careptore

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growth, their flowers thee product laterally from Cast years growth, and Their ovary and flower tube is overed by brittly on . Springs arrelace. By these chamitenstirs they are easily Estiliquishes for Echinocartus. I had separated their from Cereus proper under the hame of Echinocereus, but think it better nou to recente their sertion with Cereus. J. Mundia plant jointed førnts flat lenflike er somd, stemlike, bimokes Topines spread over the more or less even surface. or on more or less prominent taberles, never horverer i the spape of mann llance -On the arcolae mostly small barbed britles which adhere to the thing stronger spiraes also burbed therefore much more disagrable Than the other Carti. Sprines sometimes sovered with a their This is the only greeness of there membrunaviors sheath. T here mentioned, estich show a semblance of leaves. The flowers from the growth of the young joints shave al the ted preceding year. _ ovary lower part of each areola with small some ler awlship a smill round alblishaped leaf much like the leave Ceaves with arcolae, which se of which after a few month wollgandnistly or spinous areobre. How perfectly ofen i Dozes off. sunshine, without a tube sanden skaped om flat. mostly yellow, also red.

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shape direction at older Flower | size, shape are Estend from years growth. Allown, ovary, shape and muber of exterior sepils, on the leaght, or arcolae, which are for on the tube on the orang and the tube, - Thape number a 9 rolom of the inner sepals (the order greenish coursen Couples of the crown of the flower - Thape numben a O voloren of the peters, or inner, deline flow leafes. _ Eslow a d length of slaner, ___ At _ Hopertions and shape of style nember shape and d'scolour and volour of stigma ta.

Friid - shape, covering oslow wheth the remains not, how the scar, left by the corolla is haped Seed shape sije volour Figuring. Besides a general view of the plant if would be well to france at least of the mon or less globose ones, a vertical section and a horizethe sextion at least of a segment To that the exact sheepe of the plant, a oft number a d shape of ribs & groves may be MISSOURI

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distinguished, figure also two or Three tubersles of the piece of a vib with 2 or 3 aveolare a de buncher of spines separalely ad i natural Vije. - Of the former give, if possible also a vertical sertion, so that the interior parts may be well seen, especially the shape of the flower, the stamen a style a 9 stigmen, a 9 their relative proportions. (Bleston To proserve the live plant MISSOURI BOTANICAL GARDEN GEORGE ENGELMANN PAPERS The living plant van be presend for 6 to 16 months, Horythank purpose it is best to collect the - fall or writer - either the whole Mand with voot, or merely joints on outs (for the brunching ones) There spenners selected for transportation ought to be sent. left for some weeks in the shade to wither they may be wrapped up Atten in dry hay or moss and pucked togethe but not too tight nor two close a box, that they May not moulder. Midde sjed er gong speride ought to be selected; as they good better than old plants. These plants are also easily Hansfurt med for seeds. Thereseeds must be preserved lake all other seed, - they are best MISSOURI BOTANICAL

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kept by drying the fuil with containing then, whole on out in stice, if too jurity. They keep much better in the fruit. They must not be parked airtight but must be kept for mosty For the herbanicen the flower must be put up as other flowers are - it is will to that some open , __ fail if not butance van also be pressed. and also a slive of the plans if the whole, on half is too bulky; for smalle one il is will to out off a part showing the top the Busertion of some flower, Jone tubersles er vibs a I several becaker of Mines: - Langer ones will only pennil to veil of a few wibs, togeth, on the top to some Astance on the

side. _ of the means of

transportation permit if

is well enough to but away

a largen slive dned fust

pressed / where the position

and Smithin of Thines can

be seen ett

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Collection of woods.

Of smaller stem, should take
a section of the whole stems,
about a foot long of layer
ones take one half of

still larger trees take a segment
which cuts out shows the back
outen and inner wood of

possible to the centre.

Of interesting on valuable
woods it would be well to

bring along larger perimeny.

so as to that they can be

practically tested.

Seeds
While seeds especially such
of trees pine seed, aroms et.
may be best preserved by mixing
the will with dry Jand.

and seed, of other perulong, releventing plants.

Letto Colambe collections pay particular affects
not only to the flower but
also to the seed _ obtain huit & seed shever forible for they are of the highest jupestaure. Hajalsa important to have the rook on at least the base of the plant, sother the nature of that organ, van be arrestand also Shell the pluthing an annual. or a perensiele voot ! Observe the Sirection of The pine comes on the Stranches or standing of the steer in a greater or smiller angle

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